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L19: Entry 1 of 2

File: DWPI

May 23, 2002

DERWENT-ACC-NO: 2002-507656

DERWENT-WEEK: 200401

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TITLE: Inertial measurement unit/global positioning system based map navigation, method involves performing time-space filtering based on geospatial and location data to derive position of user

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PRIORITY-DATA: 2000US-236794P (September 26, 2000), 2001US-0968410 (September 26, 2001)

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <u>US 20020062193 A1</u>	May 23, 2002		029	G01C021/30
<input type="checkbox"/> <u>US 6622090 B2</u>	September 16, 2003		000	G01C021/26

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
US20020062193A1	September 26, 2000	2000US-236794P	Provisional
US20020062193A1	September 26, 2001	2001US-0968410	
US 6622090B2	September 26, 2000	2000US-236794P	Provisional
US 6622090B2	September 26, 2001	2001US-0968410	

INT-CL (IPC): G01 C 21/26; G01 C 21/30

RELATED-ACC-NO: 2004-009349

ABSTRACTED-PUB-NO: US20020062193A

BASIC-ABSTRACT:

NOVELTY - Location data are received from an integrated inertial measurement unit/global positioning system (IMU/GPS) (30). Geospatial data are retrieved from a database (38) based on location data by using a tile index file. A time space filtering is performed based on the geospatial data and location data to derive the position of a user. A trajectory of the user is displayed.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for IMU/GPS based map navigation system.

USE - For performing navigation such as personal navigation and car navigation in tunnel, forest area, urbanized terrain and high electronic countermeasure (ECM) environments.

ADVANTAGE - By utilizing the location information provided by the IMU/GPS integrated system, the geospatial database operations such as database access and query are sped up. Since the map data are provided from the geospatial database, the navigation performance and accuracy are enhanced. Real-time mapping is also supported, by using the integrated IMU/GPS system.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram illustrating the IMU/GPS based geospatial database operation.

Integrated IMU/GPS system 30

Database 38

ABSTRACTED-PUB-NO: US20020062193A
EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.1/9

DERWENT-CLASS: S02 T01 U22 W06
EPI-CODES: S02-B08C; S02-B08G; T01-J05B4P; T01-J07D3; T01-N01D; U22-G01A5; W06-A03A;

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701/207, 201, 213
51, 53, 55-56

Delorme et al. CLAIMS

What claimed is: 6321158
5948040

6321158 X_b
-266612 X_b
5948040 X_b
-38721 y_b

1. A method of transmitting a vehicle location to another location remote from the vehicle location, the method comprising:

sensing the vehicle location with a Global Positioning System (GPS) unit;
performing map matching of the sensed vehicle location with respect to an on-board previously stored map database by performing iterations with a statistical filter provided with the sensed vehicle location from the GPS unit and estimated probable locations relative to the map database coordinates;

equating the map matched position coordinates to a map database LOCUS, the LOCUS point being the position relative to the geocoded location; and

transmitting one of the map matched position coordinates or LOCUS point to the another location remote from the vehicle location.

2. The method of claim 1, wherein the map matched position coordinates or LOCUS point are wirelessly transmitted to the another location remote from the vehicle location.

3. The method of claim 1, further comprising storing the previously stored map database on an on-board storage unit.

4. The method of claim 3, wherein the on-board storage unit comprises a hard drive.

5. The method of claim 3, wherein the on-board storage unit comprises a CD ROM.

6. The method of claim 1, further comprising map matching with a Central Processing Unit (CPU).

7. The method of claim 1, further comprising statistical filtering with a Central Processing Unit (CPU).

103 met.

10 app.



8. ¹⁰ The method of claim 1, further comprising equating the map matched position coordinates to a map database LOCUS with a Central Processing Unit (CPU).

15. ⁹ The method of claim 1, further comprising displaying the map matched position of the vehicle relative to the map database with a display unit.

10. ¹ An apparatus for transmitting a vehicle location to another location remote from the vehicle location, the apparatus comprising:

a Global Positioning System (GPS) unit arranged to sense the vehicle position;

an on-board storage unit arranged to store a map database, the map database being previously stored in the on-board storage unit;

a map matcher including a statistical filter, the map matcher being arranged to perform map matching of the sensed vehicle location with respect to the previously stored map database stored on the on-board storage unit by performing iterations with the statistical filter provided with the sensed vehicle location from the GPS unit and estimated probable locations relative to the map database coordinates, the map matcher equating the map matched position coordinates to a map database LOCUS, the LOCUS point being the position relative to the geocoded location; and

a transmitter arranged to transmit one of the map matched position coordinates or LOCUS point to another location remote from the vehicle location.

17. ¹⁶ The apparatus of claim 10, wherein the transmitter comprises a wireless transmitter.

12. ⁴ The apparatus of claim 10, wherein the on-board storage unit comprises a hard drive.

13. ^{5, 3} The apparatus of claim 10, wherein the on-board storage unit comprises a CD ROM.

14. The apparatus of claim 10, wherein the map matcher including a statistical filter comprises a Central Processing Unit (CPU). CPU
6321158

15. The apparatus of claim 10, further comprising a display unit arranged to display the map matched position of the vehicle relative to the map database.

16. The apparatus of claim 10, wherein the transmitter comprises a cellular telephone.
17 2, 4

16. The method of claim 1, further comprising transmitting one of the map matched position coordinates or LOCUS point to the another location remote from the vehicle location with a cellular telephone.